



Busy senior nuclear engineer Shannon Bragg-Sitton focuses on radioisotope power systems at Idaho National Laboratory.

Nuclear engineer brings busy schedule to Idaho

By [Cathy Koon](#) for *INL Nuclear Science & Technology communications*

Busy doesn't begin to describe Shannon Bragg-Sitton's life in Idaho these days.

In addition to her new job as a senior nuclear engineer in the Space Nuclear Systems and Technology Division at Idaho National Laboratory, she chairs the [Aerospace Nuclear Science & Technology Division of the American Nuclear Society](#). ANS recently sponsored its first stand-alone topical meeting Feb. 7-10 in Albuquerque, N.M. She is also organizing a chapter of the [North American Young Generation in Nuclear \(NA-YGN\)](#) at INL.

Bragg-Sitton came to INL from [Texas A&M University](#) (TAMU), where she spent three years as an assistant professor in the Department of Nuclear Engineering. She continues collaboration with TAMU to test advanced fiber optic instrumentation for in-core measurement of temperature and neutron fluence, developing preliminary plans to test the instrumentation in the Advanced Test Reactor at INL after completing initial testing in the TAMU reactor.

"I have been involved in the space nuclear power program for a number of years," she says. She spent several years at [NASA Marshall Space Flight Center](#) conducting non-nuclear (electrically heated) testing of fission systems for space power and propulsion applications. She worked at NASA both as a graduate student from the University of Michigan's Department of Nuclear Engineering and while on loan to the space agency as a [Los Alamos National Laboratory](#) employee.



Bragg-Sitton is developing preliminary plans to test fiber-optic instrumentation she developed at INL's Advanced Test Reactor (control room shown here).

INL's Space Nuclear Systems

Bragg-Sitton speaks enthusiastically about her work with INL's Space Nuclear Systems and Technology Division. She describes the division's primary focus as the development and assembly of radioisotope power systems for space exploration. The division also conducts work in advanced fission systems for space power and propulsion.

Bragg-Sitton has been involved with the radioisotope side of the division, investigating options for the domestic restart of Pu-238 production. Her primary role is in development of fission power systems for space applications. INL is working with NASA on the development of a fission power system for a lunar base, but this could be modified for a Mars application.

Since joining the INL team, she has begun looking at options for nuclear testing of the fission surface power system, to include possible zero-power critical testing at the Nevada National Security Site.

"Additionally, we anticipate work to ramp up in the development of nuclear thermal propulsion systems for application in manned missions to Mars in the coming year," she says.

Family concerns were part of the reason Bragg-Sitton relocated to Idaho. As a tenure-track faculty member at TAMU, her time was split among teaching courses, conducting research and filling other departmental duties, including committees and professional society participation.

"I opted to leave full-time academia to pursue more research-oriented work and allow more time to spend with my relatively young family," Bragg-Sitton says. She is the mother of three children younger than 5.

"The tenure-track role is very demanding and is certainly much more than a 40-hour-per-week job," she says. "By stepping down to focus more on one aspect of my career (research vs. research and teaching), I am able to spend a bit more time at home."

She could have returned to Marshall Space Flight Center or come to INL. She chose INL, where she is able to play a role in the space nuclear systems development via NASA-supported work and begin playing a part in the development of advanced nuclear systems.

"Ultimately, I chose INL because of all the exciting activity in nuclear that is going on here," she says. "I can work on my primary love of space nuclear systems while also coming up to speed on advanced terrestrial systems, nuclear testing in a premier test reactor facility, development of new nuclear test facilities and more."

Chairing ANS meeting

Bragg-Sitton recently finished serving as the general chair of the ANS's topical meeting — the [2011 Nuclear and Emerging Technologies for Space](#) — in Albuquerque.



ATR manager Ed Schuebert discusses logistics of testing in the ATR with Bragg-Sitton.

The conference provided a venue for nuclear and aerospace professionals to present their work in advanced space power and propulsion systems.

In an effort to better attract professionals from both nuclear and aerospace, the conference was co-sponsored by the American Institute of Aeronautics and Astronautics.

The keynote speaker for the conference dinner was Dr. Harrison "Jack" Schmitt, Apollo 17 astronaut and former U.S. senator from New Mexico. Schmitt is the secretary-designate of the New Mexico Energy, Minerals and Natural Resources Department. The five technical tracks for the conference sessions included Missions and Architectures, Fission Power and Propulsion, Radioisotope Power Systems, Nuclear Thermal Propulsion, and Advanced Concepts.

"NETS-2011 was the premier conference in 2011 covering advanced power and propulsion systems for landed and in-space applications," says organizer Bragg-Sitton. "With authors hailing from universities, national laboratories, NASA facilities and industry, NETS-2011 provided an excellent communications network and forum for information exchange."

The next generation of nuclear professionals

Bragg-Sitton sees a need for a chapter of the NA-YGN at INL. NA-YGN unites young professionals from across the full breadth of nuclear science and technology — including engineers, technicians, HR professionals, communications experts and lawyers — and across North America.

"NA-YGN brings together the different sectors of nuclear science and technology to speak with a united voice for a common goal and to provide professional development opportunities for its members," Bragg-Sitton explains. "NA-YGN also looks for avenues to enhance recruiting and retention of young professionals in the field of nuclear science and technology. These are key needs in many companies and laboratories that have difficulty attracting young professionals to relatively remote work locations, and keeping them once they get there."

The organization works internationally but also focuses on regional and local activities such as professional development seminars and workshops; community outreach activities in the form of teacher workshops, presentations to elementary schoolchildren and career fairs; communications workshops; mentoring; and social networking.

The road to Idaho

Bragg-Sitton's own professional development was a long road.

She has a bachelor's degree in nuclear engineering from TAMU, a master's degree in medical physics from the University of Texas at Houston, and a master's degree and doctorate in nuclear engineering from the University of Michigan. Her father spent his career in the Air Force, so the family moved around a bit. She claims Albuquerque, N.M., as home. That is where her father retired from the Air Force to work at Sandia National Laboratories, and where she went to high school.

Bragg-Sitton married a fellow Aggie, so leaving TAMU was a tough decision – but the family is always up for a new adventure.

"The kids keep us pretty busy, but when we can get away, we really enjoy scuba diving (our most recent trip was to dive off the coast of Belize)," she says. "We hope to adopt hiking as a new pastime as we get more familiar with the Idaho area."

[Feature Archive](#)



Leaving full-time academia not only allows Bragg-Sitton to pursue research-oriented work, but it also gives her more time to focus on her young family.